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Promoting animal welfare and pet-friendly urban design: an educational program to foster knowledge and responsibility in primary school children

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Abstract: The field of Human-Animal Interaction (HAI) has gained growing interest due to the numerous benefits animals bring to human well-being, particularly in educational contexts. This study investigates the impact of an educational anthrozoology program conducted in primary schools in Lucca, Italy. The program aimed to teach children how to responsibly interact with dogs, design pet-friendly cities, and understand the benefits dogs offer to various populations, including the elderly and individuals with disabilities. The intervention involved 4 classes of 1 hour each, with pre- and post-program questionnaires used to assess changes in knowledge and attitudes. Results showed a significant improvement in children's understanding of dogs' needs, pet-friendly urban features, and the societal benefits of pets. Qualitative analysis of children's drawings and reflections revealed a increased sensitivity toward animal welfare and creative ideas for pet-inclusive community spaces, such as nursing home visits and designated pet parks. The program demonstrated that educational anthrozoology project, even without direct animal interaction, effectively promotes empathy, responsibility, and pro-social behaviour in children. This study highlights the potential of educational anthrozoology programs to inspire future generations to advocate for animal welfare and inclusive urban planning, fostering a more compassionate society.

Key Words: Human Animal Interaction; HAI; Educational Anthrozoology; Pet-friendly cities.

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Introduction

In the last decades Human-Animal Interaction (HAI) has raised attention, especially thanks to the scientific studies showing the physical, psychological and social benefits that animals can bring to people (Barker & Wolen, 2008; Friedmann and Krause-Parello 2018; Borrelli et al., 2022).

In children, interaction with pets can improve critical aspects of their development like empathy, responsibility, autonomy and prosocial behavior (Friesen, 2010; Jalongo et al., 2004). Specifically, educational anthrozoology programs in schools offer a variety of benefits that enhance the educational experience and promote wellbeing among students. Engaging with animals fosters empathy and compassion in students, as they learn to care for and understand the needs of other living beings (Ngai et al., 2021). Other studies have found that interactions with animals can reduce stress and anxiety levels in students, creating a more relaxed learning environment (Cirulli et al., 2011; Gee et al., 2017). Regarding educational improvement, studies indicate that the presence of animals in educational settings can improve cognitive competence, reading skills and overall academic performance (Pinto et al., 2015; Verhoeven et al., 2023). In addition, animals can increase motivation and engagement in learning activities (Gee et al., 2017; Meints et al., 2018).

Programs centred on anthrozoology emphasize not only the care and welfare of animals but also how animals can enrich human lives, particularly through therapy and companionship. Mariti et al. (2011) found that educational anthrozoology programs effectively improve children's humane attitudes and reduce fear of animals, especially when children are taught about animal behaviour and welfare through structured activities. Furthermore, these educational programs

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play a crucial role in preparing children to understand and advocate for animal welfare within the context of urban planning. As urban areas increasingly adopt pet-friendly policies, children who take part in these programs often develop a greater sense of community responsibility and care for the environment. The conceptual framework outlined in Rock et al. (2015), emphasizes that educational initiatives can guide local governments in creating inclusive environments that consider both human and animal needs.

The aim of this study was to investigate whether an educational program could help children learn about caring for dogs and understand the positive role dogs can play in society.

Materials and methods

Ethical statements

The study obtained the approval of the bioethics committee of the University of Pisa, Italy (n. 30/2021). An informed consent was obtained from the parents/legal guardian of the children prior to the collection of questionnaires.

Data collection

The educational program took place in 3 different primary schools (5 classes, 75 children of 8-10 years old) in the city of Lucca (Italy). The programme included in total 4h aimed at raising awareness among children about the correct management of and approach to dogs, as well as teaching them the basics on how to design a pet-friendly city, and how a dog can bring benefits to different categories of people. We chose to focus specifically on dogs because they are usually the most popular pets among children/families, and more relevant for urban planning.

A specific questionnaire was designed to assess children's knowledge about covered topics, filled up at baseline (before the starting of the programme) and at follow up (after the last lesson) by children; among the 75 attending children, 45 of them filled in questionnaires both at baseline and follow up.

The survey included 13 questions, 5 about demographics and 8 about general information regarding dogs' management pet friendly and how dogs can bring benefits to different categories of people (for further information see tables 1 and 2).

During one class a specific "mindset change" tool provided and managed by Design for Change Spain partner was used to better structure the children's activities. This organization facilitates the empowerment and wellbeing of young people so that, through design and taking action, they can design innovative and sustainable solutions to the social issues that affect them. One of the filled tools is presented in fig. 1. The tools supported the students in approaching the topic, selecting an idea, making a prototype by the way of a painting. In a second part the student was invited to reflect on how to take active part in promoting the idea, by searching for collaboration at different level (at school, in the family, at the local institutions) to find support to their ideas (the idea were sometimes discussed and elaborated in pairs, but students could also work individually) as well as to gather the main aspect that captured them during the activities and the discussion in the class.

Statistical Analysis

Statistical analyses comprised descriptive statistics of demographics and chi-square analysis of the responses for both baseline and follow up questionnaire

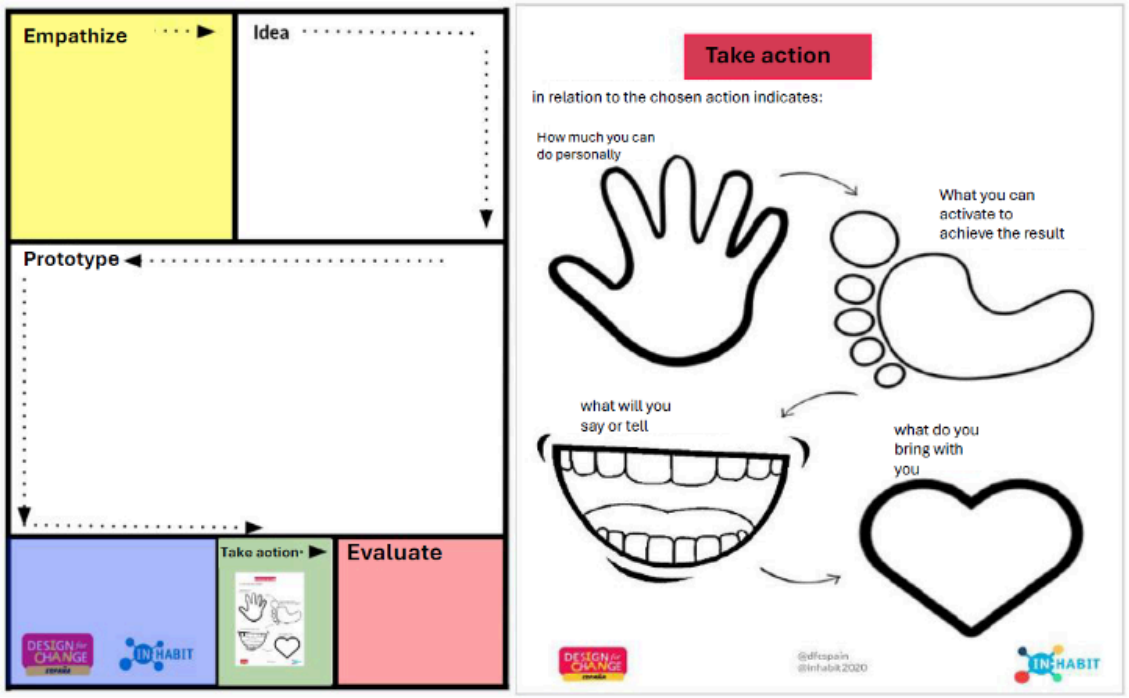

Figure 1. Form used for the schools' educational activities with Design for Change Spain

Results

The descriptive statistics of demographics are described in table 1

Do you own pets?		
	Frequency	**%**
None	8	9.5
Dog	23	27.4
Cat	24	28.6
Rabbit	8	9.5
Pig	4	4.8
Bird	5	6.0
Tortoise	4	4.8
Other	8	9.5
Are there any pets you are afraid of?		
	Frequency	**%**
None	36	81.8
Dogs	8	18.2
Cats	0	0
Other	0	0

What do you think about pets?		
	Frequency	**%**
I adore them	35	76.1
I like them	8	17.4
I am not interested in them	0	0
I can't stand them	0	0
What is a dog for you?		
	Frequency	**%**
A friend who needs attention	42	91.3
An enemy	1	2.2
A stranger	0	0
A toy	0	0

Table 1. Descriptive analysis for demographics.

Chi-square tests show a statistically significant improvement in the correct responses post-program (for a summary of significant responses see table 2). This indicates that our educational program effectively enhanced students' knowledge and attitudes towards pets, as evidenced by the increased understanding and positive perceptions reported.

Question	**Children who gave correct reply both times**	**Children who gave correct reply at follow up**	**Improvement**	**% of improvement**	**Fisher test sign.**
What do you need in a pet-friendly city?					
1-Places where dogs can run and play	39	42	3	60	0.053
2-Places where dogs can drink	33	40	7	64	0.023
3-Dog waste bins	28	38	10	63	0.015
4-Public places accessible for dogs	17	17	0	0	<0.001
5-Veterinary clinics	28	35	7	47	0.002
6-Pick up after dogs	32	37	5	38	<0.001
7-Let dogs stay with their owners	29	33	4	33	0.001
Can pets help people with their health or wellbeing?					
Yes, they can help making new friends	21	30	9	47	0.035
What are dog's needs?					
Food and drink everyday	42	42	0	0	0.006
Walking	38	40	2	33	0.001
Spend time with their owner	34	36	2	25	0.001
Go to the vet	32	36	4	33	<0.001

Table 2. Improvement in children's knowledge. The table shows the number of children who provided correct answers both times and those who improved their responses in a follow-up questionnaire. The percentage of improvement is calculated, along with the significance level of the Fisher test for each question.

From a more qualitative point of view, it is worth noting that, in the proactive activity of mindset change, children have offered an interesting emotional feedback, both taking into consideration their paintings, the contents of their ideas, the way they were working together, the involvement of children with disabilities and their strong engagement with animals.

During the activities more than one child wrote about how dogs can help elderly people proposing initiatives such as bringing dogs in nursing homes to improve residents' wellbeing. Many students focused on the animal needs suggesting larger spaces and parks for better management. These areas can allow dogs to play with their owners, but at the same time keep safe those people who are afraid of animals.

The paintings often suggested the idea of pets as Animal-Nature Based Solution (A-NBS) supporting elders and people with some difficulties (blinded but not only). At the same time, for children, pets create a link with the grandparents also because many of them meet pets in their home and so they become a clear link with them. Again, in some cases pets emerge as their close companions in everyday life (for example when they cry for something, when they sleep).

In some cases, this new way of looking at animals gives the ideas of new job opportunities (clinics devoted to training pets for people with difficulties or guides to teach how to run dogs). In one case quite original and innovative A-NBS were introduced, like the idea that dogs can support elders to carry the bags to help them getting off the bus.

When it came to supporting their ideas more concretely, most children suggested to organize crowdfunding to collect enough resources, in other cases they wanted to support themselves with the organisation of new spaces and activities. In addition, they recognize that those activities often need the support of their parents or of the whole family, of their friends, but that quite often might also involve the local institutions, the school, and mainly the Major of the city.

The educational activities on A-NBS provided several key takeaways, like the empathy for animals, the support they can offer to people in need (elders), but also how important to them their own pets are. More than one child said that it was good to learn new things about dogs. For some of them, it was also important to work directly with a friend in the school, or to plan for a city more attentive to animals and their relationship with humans.

Discussion

The results from the questionnaires administered before and after the program revealed a significant increase in correct answers after the lessons: most children improved their understanding of dogs' needs, such as space, social interaction, access to veterinary services, and the correct way to approach and interact with a dog. This change suggests that the program was effective in promoting greater awareness and sensitivity towards pets. These findings align with previous research suggesting that engaging students in educational anthrozoology can increase responsible and humane behaviour towards pets (Mariti et al., 2011). Unlike other educational projects involving pets that relied on direct interaction with animals to reduce stress and anxiety (Cirulli et al., 2011; Gee et al., 2017) or to improve academic skills like reading (Jill Steel and McGeown, 2021), this program used a project-based approach, showing that, even without direct animal contact, educational tools can effectively promote positive attitudes toward animals and their welfare. This represents an important contribution to the current literature, as it highlights that educational anthrozoology can be impactful even in settings where the physical presence of animals is not always feasible. Other studies focused on the importance of educational projects in schools for children with specific needs (like autism, ADHD etc…) (Busch et al., 2016; Kovács et al., 2024) or on the awareness on how to approach dogs in order to reduce bite accidents (Chapman et al., 2000; Lakestani and Donaldson, 2015); as their purposes were very different, results cannot be easily compared, although overall educational projects show a positive impact on children. What

makes this program innovative is its integration of social and urban topics, placing the human-animal relationship in a larger framework that includes community wellbeing and inclusive city planning (a relatively underexplored area in current research).

One innovative aspect of this educational program was its focus on "pet-friendly urban planning", encouraging children to think critically about animals, particularly in the context of people's health and wellbeing. The results from our project highlighted how children not only learned about dogs' needs but also were able to design city spaces that accommodate animals and provide benefits to people, especially vulnerable groups like elderly or disabled people. The inclusion of the "mindset change" approach played a key role, as it allowed children to imagine a city that integrates the needs of pets and to reflect on how they could actively contribute to creating an inclusive community. The invitation to develop project proposals gave children the opportunity to think critically and creatively, highlighting aspects like collaboration and teamwork. For instance, children proposed creating dedicated dog spaces in parks and suggested safety measures for people who might be afraid of animals.

From a qualitative perspective, the analysis of the children's drawings and reflections highlighted a deep sensitivity and significant emotional bond with dogs and, more generally, with pets. Many students emphasized the importance of the relationship between dogs and the elderly, proposing initiatives like bringing dogs into nursing homes to improve elderly wellbeing. This indicates not only an empathy developed towards animals but also an understanding of the benefits of animals' presence for people in vulnerable situations.

The study did have limitations, such as a small sample size, which limits the ability to generalize results, and the lack of a practical lesson with the direct involvement of a dog, which would have likely improved children's understanding of how to safely approach animals.

Conclusions

In conclusion, the educational program proved to be an effective means to raise awareness of the benefits of human animal interaction and to promote a sense of responsibility and active engagement among children, as well as to improve students' attitude towards animals. The educational activities had a positive impact on the perception and respect for dogs and stimulated concrete ideas for a more inclusive and pet-friendly city. By integrating these educational elements into urban planning discussions, a generation of advocates who prioritize animal welfare and promote inclusive community designs that benefit all residents can be cultivated. Future studies might explore how direct involvement with animals, combined with project-based learning, might strengthen these positive attitudes. This approach could help children retain lasting knowledge about animal welfare and inspire them to develop innovative ideas for pet-friendly city.

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Promuovere il benessere degli animali e la progettazione urbana pet-friendly: un programma educativo per promuovere la conoscenza e la responsabilità nei bambini della scuola primaria

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Sintesi

Il campo dell'interazione uomo-animale (HAI) ha suscitato crescente interesse grazie ai numerosi benefici che gli animali apportano al benessere umano, in particolare nei contesti educativi. Questo studio indaga l'impatto di un programma educativo di antrozoologia condotto nelle scuole primarie di Lucca, in Italia. Il programma mirava a: insegnare ai bambini come interagire responsabilmente con i cani, progettare città pet-friendly e comprendere i benefici che i cani offrono a diverse fasce di popolazione, inclusi anziani e persone con disabilità. L'intervento ha previsto 4 lezioni di 1 ora ciascuna, con questionari pre e post programma utilizzati per valutare i cambiamenti nelle conoscenze e negli atteggiamenti. I risultati hanno mostrato un miglioramento significativo nella comprensione da parte dei bambini dei bisogni dei cani, delle caratteristiche urbane pet-friendly e dei benefici sociali degli animali domestici. L'analisi qualitativa dei disegni e delle riflessioni dei bambini ha rivelato una maggiore sensibilità verso il benessere degli animali e idee creative per spazi comunitari inclusivi per gli animali domestici, come visite in case di riposo e parchi designati per animali domestici. Il programma ha dimostrato che il progetto educativo di antrozoologia, anche senza interazione diretta con gli animali, promuove efficacemente empatia, responsabilità e comportamenti pro-sociali nei bambini. Questo studio evidenzia il potenziale dei programmi educativi di antrozoologia per ispirare le generazioni future a sostenere il benessere degli animali e una pianificazione urbana inclusiva, promuovendo una società più compassionevole.